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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,873	07/30/2003	Shingo Johgan	4034-39	7357
23117	7590	11/15/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			WANG, GEORGE Y	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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2. Claims 1-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi (U.S. Patent No. 6,184,959) in view of Sumino et al. (U.S. PG-Pub No. 2002/0060771, hereinafter "Sumino").

3. As to claim 1, Izumi discloses a color filter substrate comprising a base member (CF substrate, fig. 4, ref. 1), a color filter layer (fig. 5, ref. 4), which is provided on the base member and which is made up of a first, second, and third group of color filters each representing three different colors (fig. 5, ref. R, G, B), and a plurality of spacers (fig. 5, ref. 7), which are provided at predetermined relative positions for selected ones of the color filters, such that the smallest number of color filters of the first, second, or third group is at least 80% of the largest number of color filters of the first, second, or third group (fig. 5).

However, the reference fails to specifically disclose that some but not all of the color filters of each of the first color, second color, and third color are provided with spacers.

Sumino discloses an LCD where some but not all of the color filters (fig. 5, ref. 5) of each of the first color (R), second color (G), and third color (B) are provided with spacers (7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an LCD where some but not all of the color filters of each of the first color, second color, and third color are provided with spacers since one would be motivated to enable the formation of a pattern manifesting large elastic deformation

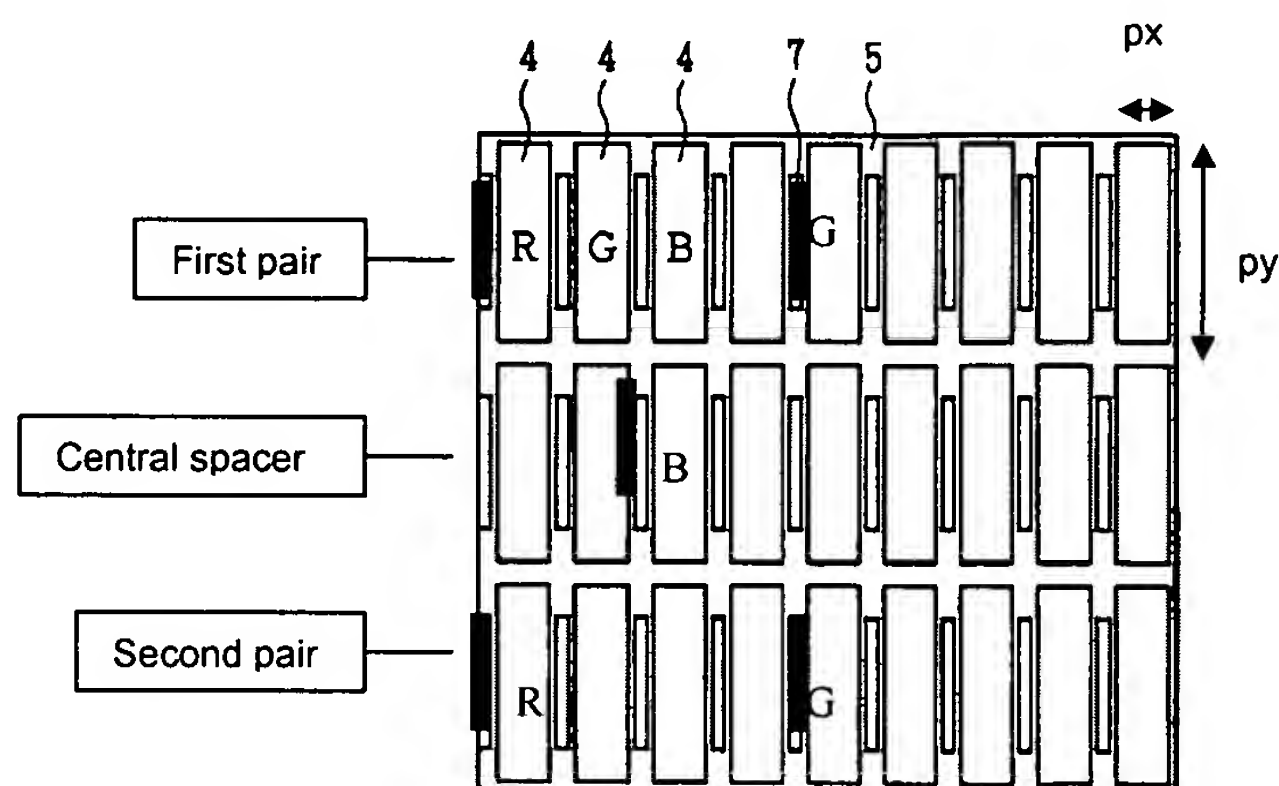
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ratio and small plastic deformation ration in a wider temperature range for setting the thickness of the LC layer to ultimately provide excellent display qualities ([0007], [0028]-[0030]).

4. Regarding claims 2-4, Izumi discloses the color filter substrate as recited above, where the spacers are arranged in at least 80% of a display area (representing entire display area, fig. 1), are provided in gaps between the color filters (fig. 5), and are columnar spacers (fig. 2, ref. 7).
5. As per claims 5-6, Izumi discloses the color filter substrate as recited above, where the color filters are arranged at a predetermined pitch, p_x , in a row direction and at another predetermined pitch, p_y , in a column direction, respectively, and where the spacers include a set of five spacers, the first pair being separated from each other by a distance of $m * p_x$ (where m is an integer equal to or greater than 2 by is not a multiple of 3) in a row direction, the second pair being separated from the spacers of the first pair by a distance of $n * p_y$ (where n is a positive integer and a multiple of 2) in the column direction, and the central spacer being separated from the spacers of the first pair by a distance of $m * p_x/2$ in the row direction and by a distance of $n * p_y/2$ in the column direction, respectively (see clarifying references included by Examiner in fig. 5 below), such that the first pair of spacers and the central spacer consist of a first spacer, a second spacer, and a third spacer associated with the first, second, and third groups of color, respectively, the second pair of spacers and the central spacer consist of

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another first spacer, another second spacer, and another third spacer associated with the first, second and third groups of color filters, respectively (see clarifying references included by Examiner in fig. 5 below).



6. Regard claims 8 and 9, Izumi discloses the color filter substrate as recited above, where the color filters include multiple sets of color filters consisting each of three group for which the spacers are provided belong to a mutually different set of color filters and where the color filters provided with the spacers are not adjacent to each other (fig. 5).

7. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi in view of Sumino, and in further view of Shibahara (U.S. Patent No. 6,317,188).

8. As per claim 7, Izumi, when modified by Sumino, discloses the color filter substrate as recited above, however, the reference fails to specifically disclose that the spacers of the first pair are adjacent to each other in the row direction, that the spacers of the second pair are adjacent to each other in the row direction, and that the spacers

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of the first and second pairs include spacers that adjacent to each other in the column direction.

Shibahara discloses a color filter substrate (fig. 1) where the spacers of the first pair are adjacent to each other in the row direction (fig. 1 ref. 21), that the spacers of the second pair are adjacent to each other in the row direction (fig. 1 ref. 21), and that the spacers of the first and second pairs include spacers that adjacent to each other in the column direction (fig. 1 ref. 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the spacers of the first pair are adjacent to each other in the row direction, that the spacers of the second pair are adjacent to each other in the row direction, and that the spacers of the first and second pairs include spacers that adjacent to each other in the column direction since one would be motivated to increase the freedom of the substrates to flex, so that it is easier for the TFT and CF substrates to track the dimensional changes in the panel gap caused by thermal expansion and contraction of the liquid crystal (col. 7, lines 36-44; abstract). This ultimately serves to prevent problematic formation of liquid crystal bubbles (col. 7, lines 53-67).

9. As to claim 10, Izumi, when modified by Sumino, discloses the color filter substrate as recited above, however, the reference fails to specifically disclose that the spacers are arranged at a density of 800 to 1,200 spacers/cm² with respect to the color filter layer.

Shibahara discloses a color filter substrate (fig. 1) where the spacers are arranged at a density of 800 to 1,200 spacers/cm² with respect to the color filter layer (one spacer per [300 μm]², col. 7, line 61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the spacers arranged at a density of 800 to 1,200 spacers/cm² with respect to the color filter layer since one would be motivated to increase the freedom of the substrates to flex, so that it is easier for the TFT and CF substrates to track the dimensional changes in the panel gap caused by thermal expansion and contraction of the liquid crystal (col. 7, lines 36-44; abstract). This ultimately serves to prevent problematic formation of liquid crystal bubbles (col. 7, lines 53-67).

Response to Arguments

10. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant amends independent claim 1 to recite the new limitation that "some but not all of the color filters of each of the first color, second color, and third color are provided with spacers." However, the Sumino reference clearly teaches an LCD where some but not all of the color filters (fig. 5, ref. 5) of each of the first color (R), second color (G), and third color (B) are provided with spacers (7) to enable the formation of a pattern manifesting large elastic deformation ratio and small plastic deformation ration in

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a wider temperature range for setting the thickness of the LC layer to ultimately provide excellent display qualities ([0007], [0028]-[0030]).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George Wang
Patent Examiner
AU 2871
November 8, 2005


ANDREW SCHECHTER
PRIMARY EXAMINER